ABCDDV/809

ABCD Arq Bras Cir Dig
2011;24(4): 262-266

Original Article

INFILTRATIVE ANALGESY IN VIDEOCOLECISTECTOMY: A RANDOMIZED CLINICAL TRIAL

Analgesia infiltrativa na videocolecistectomia: ensaio clínico randomizado

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ABSTRACT - ***Background*** - Large proportion of surgical patients experience severe pain postoperatively. ***Aim*** - To evaluate the analgesic efficacy of infiltration on incision of laparoscopic cholecistectomy with ropivacaine and the effect on opioids consumption. ***Methods*** - A prospective, randomized, double-blind study was conducted, where 70 patients undergoing laparoscopic cholecistectomy were divided into two groups, I (infiltration) and C (control). After 12 hours of post-operative patients were interviewed and answered the Visual Analogue Scale. The consumption of opioids was evaluated through medical records at the time of interview. ***Results*** - When comparing the intensity of pain in both groups, was noticed a better profile of pain in the intervention group, with 44.4% reported mild pain, moderate pain 50% and 5.6% severe pain. In group C the respective values were 38.2%, 50% and 11.8% (P = 0.622). The group I had lower average pain, 2.75, compared with group C, 3.75, but this result was not statistically significant (P = 0.319). Similarly group I opioids had a lower consumption than group C, 47.2% and 52.9% respectively, although with no statistical significance (P = 0.632). ***Conclusion*** - The infiltration of the incisions with ropivacaine, although without statistical significance, produced reduction in the postoperative pain, as well as reduced the consumption of opioids after 12 hours.

HEADINGS - Cholecistectomy. Laparoscopy. Analgesia. Local anesthesia.

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Financial source: none
Conflicts of interest: none

Received for publication: 05/02/2011
Accepted for publication: 14/06/2011

RACIONAL - ***Racional*** - Grande parte dos pacientes cirúrgicos experimenta dor intensa no pós-operatório. ***Objetivo*** - Avaliar a eficácia analgésica da infiltração das incisões da colecistectomia laparoscópica com ropivacaína, bem como seu efeito sobre o consumo de opióides. ***Métodos*** - Foi realizado estudo prospectivo duplo-cego randomizado, em que 70 pacientes submetidos a colecistectomia laparoscópica foram divididos em dois grupos, I (infiltração) e C (controle). Após 12 horas de pós-operatório os pacientes foram entrevistados e responderam a Escala Visual e Analógica da Dor. O consumo de opióides foi avaliado através dos prontuários médicos, no momento da entrevista. ***Resultados*** - Notou-se melhora da dor no grupo intervenção sendo que 44,4% revelaram dor leve, 50% dor moderada e 5,6% dor intensa. Já no grupo C os respectivos valores foram 38,2%, 50%, e 11,8% (P=0,622). O grupo I apresentou menor média de dor, 2,75, comparada com o grupo C, 3,75, mas esse resultado não foi estatisticamente significante (P=0,319). Da mesma forma o grupo infiltrado consumiu menos opióides que o grupo controle, 47,2% e 52,9 respectivamente, embora sem significância estatística (P=0,632). ***Conclusão*** - A infiltração das incisões da videocolecistectomia com ropivacaína, conferiu diminuição na dor pós-operatória, bem como reduziu o consumo de opióides após 12 horas de pós-operatório.

DESCRITORES - Colecistectomia. Laparoscopia. Analgesia,. Anestesia local.

INTRODUCTION

Laparoscopic cholecystectomy (LC) became the surgery of choice for patients with benign disease of the gallbladder[1,3]. Its advantages compared to laparotomy are well established: less postoperative pain, better cosmetic results, low hospitalization time, convalescence and faster return to usual daily activity[1,15].

The pain, however, is still one of the main complaints recorded in the postoperative[7,18]. It can arise from the incision (incisional pain), visceral structures (abdominal pain) or from the sub-diaphragmatic pain related over the shouder[9]. But, most patients refer particular localized pain at the

insertion portal points[10,18].

The concept that postoperative pain is normal and expected, associated with lack of knowledge about the physiology and pharmacology of analgesics and anesthetics, makes the team's attention to more common postoperative complications (fistulas, infection, bleeding) than the symptom that most bothers the patient: local pain. The result is that the majority of surgical patients experience severe pain in the early postoperative period[2].

It is not just a "not pay attention" situation; it involves complex physiological reactions with autonomic and psychological manifestations that lead to immunosuppression, decreased tissue perfusion, increased oxygen consumption and cardiac work, muscle spasm, the change in respiratory mechanics and the release of stress hormones, resulting in increased catabolism and alteration of the nitrogen balance. Also, due to lower mobilization, there is an increase on the risk of pneumonia and venous thrombosis, with direct relationship with increased patient morbidity and mortality[6,12].

Local anesthetics act on sodium channels of nerve endings, blocking the transmission of nociceptive stimuli. Ropivacaine has been described as having less action on the motor fibers (sensory-motor dissociation) and lower cardiovascular toxicity, especially as a local anesthetic for pain control[18].

The infiltration of local anesthetic in the insertion of laparoscopic instruments on portal areas is simple technique that aims to reduce or eliminate the pain caused by injury to the abdominal wall, and consumption of analgesics[4,14,19], being free of adverse effects at usual doses[13]. However, the clinical value of wound infiltration with local anesthetics, and the choice and dosage of local anesthetics remain controversial[11].

Although the LC provides less postoperative pain compared to laparotomic operation, several studies have shown that patients report moderate to severe pain postoperatively[5,18]. This fact confirms that further research is needed to reach new procedures and protocols oriented to decrease the patient's pain.

On this basis, this study aims to evaluate both the analgesic efficacy of infiltration with ropivacaine in LC incisions, as its influence on the postoperative use of opioid analgesics.

METHOD

Was conducted a prospective randomized double-blind trial. The sample consisted of all patients undergoing elective LC on the Department of General Surgery, Hospital Nossa Senhora da Conceição in the period April to September 2010. The sample was randomized according to the week in which the operation took place and all operations occurring during a week belonged to the same group. The first week was a lottery held to determine whether it was related to group I, which was infiltrated local anesthetic, or group C, which received no infiltration. The following week corresponded to the other group and so consecutively throughout the study period. Exclusion criteria were: patients younger than 18 years, allergy to ropivacaine, an operation that has been converted, unable to respond or understand the scale and Visual Analog Pain Scale (VAS).

To evaluate the effect of local anesthetics on the use of opioids (tramadol hydrochloride), the protocol of prescription drugs after the LC was modified. The drug tramadol no longer had fixed prescription in 6/6 h schedule; started to be used only if necessary; the remainder medication of the protocol was maintened, with analgesic drug based on dipyrone and Profenid.

With the patient under general anesthesia, after removal of the gallbladder - if he was in group C -, the surgeon proceeded to close the skin. If he was in group I, the surgeon performed subcutaneous infiltration of 10 ml of 1% ropivacaine divided into four incisions before closure of the skin. All the rest of the surgical procedure was performed without anesthetic and changes in both groups.

At 12 hours postoperatively the patients were interviewed. All the data collection was done, which contained the following variables: age, gender, medical record number, VAS, use of tramadol and number of doses. In VAS, that quantifies the patient's pain, the score is 0 for no pain, 1-3 mild pain, 4-6 moderate pain, 7-10 severe pain. Neither the patient nor the interviewer knew which group the patient belonged. The arrival on the ward was regarded as 0 hour after surgery.

At the time of admission, the team explained about the experiment and patient, when agreed to participate signed a consent form. This study was submitted to the ethic comitte of Unisul under number 10.698.4.01.III

Data were tabulated in Excel and analyzed using SPSS 15.0. Qualitative variables were analyzed by chi-square and Fisher's exact test. Multivariate analysis was performed by logistic regression to adjust the variables associated with pain moderate/severe based on the VAS. The confidence interval was 95%.

RESULTS

The study population was initially composed of 74 patients, four of them were excluded, two because they were under 18, one due a concomitant liver biopsy performed during surgery and one due to the impossibility of understanding what VAS was.

Thus, 70 patients remained in the study.

Regarding gender, 53 (75.7%) were females and 17 males. The average age of patients was 48, 1 years (SD = 17.91).

There was no need for conversion to laparotomy, either case of allergy or side effect to ropivacaine. All 70 patients were discharged the day after the operation (Table 1).

TABLE 1 – Sociodemographic and clinical characteristics according to groups

Variável	Infiltration group	Control group	p
Gender			
male	8 (23,.5%)	9 (25.0%)	0.88
female	26 (76.5%)	27 (75.0%)	
Age (mean ± standard deviation)	53,53± 16.79	43,21± 17.77	0.78
Use of tramadol			
yes	17 (47.2%)	18 (52.9%)	0.63
no	19 (52.8%)	16 (47.1%)	

Regarding the procedure, 36 were in group I (Infiltration) and 34 C (control). Half of the patients (35) requested an average tramadol dose of 1.14.

With respect to the intensity of postoperative pain, 29 classified it as mild, moderate in 35 and six as intense. The overall mean VAS was 3.04 (SD = 2.51). (Table 2)

TABELE 2 – Distribution of patients regarding the severity of pain according to VAS in groups I and C

Group	Light (0-3)	Moderate (4-7)	Severe (8-10)
Control	13 (38.2%)	17 (50%)	4 (11.8%)
Infiltration	16 (44.4%)	18 (50%)	2 (5.6%)

p=0.622

The 36 study patients who received 1% ropivacaine at the incision site were compared with 34 control patients who did not receive local anesthetic, at 12 hours after surgery. There was no statistical difference between the two groups regarding age and gender (P = 0.886).

When comparing the intensity of pain in both groups, as shown in Table 1, was observed a better profile of infiltration group, where 44.4% had mild pain, 50% moderate, 5.6%, severe pain (group I). In group C the respective values were 38.2%, 50%, and 11.8%. However, this result was not statistically significant (P = 0.622).

When was compared the use of tramadol in both groups, although not statistically significant (P = 0.632), group C requested more medication 52.9% against 47.2% in group I.

When comparing the mean VAS in the two groups, group I and group C averaged 2.75 and 3.35. However, this difference was not statistically significant (P = 0.319).

When comparing the mean VAS between the genders, women had an average of 2.75 while men average of 3.94. This result was not statistically significant (P = 0.090).

The logistic regression analysis showed that the only factors associated with pain moderate/severe were gender and age. Men related seven times more pain moderate/severe, and for each increase of one year of age significantly increased 0.04 units in the visual scale of pain. The use of tramadol and infiltration with ropivacaine in the wound were not associated with increases of moderate/severe pain (Table 3).

TABLE 3 – Multivariate analysis by logistic regression of variables associated with pain moderate / severe

Variable	* ORadj	95% †	p
Masculine	7.72	1.49 to 39.92	0.015
Use of tramadol	2.074	0.63 to 6.82	0.230
Group	0.994	0.33 to 2.97	0.991
Age (years)	1.044	1.008 to 1.081	0.017

* Adjusted odds ratio; † confidence interval 95%

DISCUSSION

Most patients were females representing 75.7%; similar result was found by other authors (90% and 80%)[1,8]. The average age was 48.1 years, similar age group was shown in the literature[8].

LC was successful in all cases without any intraoperative complications or need for conversion to laparotomy[17]. In this series there were no cases of allergy, toxicity or side effects attributed to ropivacaine, as demonstrated in similar studies[8,15,16].

The literature does not provide conclusive information about the ideal time for the local anesthetic infiltration[5]. Some authors claim that is before making the incisions (pre-incision)[7,8,10] for suggesting that the local anesthetic reduces the release of local inflammatory mediators, with better analgesic effect[10]. Other authors[8,9] recommend that the best time is before the skin suture, at the end of the operation. Grumberg[8] said that the sites of introduction of the trocars can be modified during operation, and the local anesthetic action time is limited, so, the later is performed better is. In this study was chosen to do at the end of the operation. It was used as a local anesthetic ropivacaine because it is safe and have a prolonged action[17].

The VAS was verified 12 hours after surgery, theoretically timeout action of ropivacaine. However, studies show that wound infiltration with local anesthetics significantly reduces postoperative pain and consumption of narcotic analgesics until 24 h

after LC[10,11]. In some studies it was decided to do the interview with one and two hours of postoperative time[8]. But the interview so early can be impaired by the state of clouding the patient has, not fully recovered from general anesthesia.

The control group did not have any kind of infiltration with placebo to maintain blinding, since the wound was always covered in bandages, the patient was unconscious during the procedure and the evaluator was not present in the operation and at no time knew which group the patient belonged to. Such behavior was also made in similar studies[8,10]. The use of placebo (saline) has been tested and found no differences in mean scores of abdominal pain after the operation between the control group and saline[11].

When comparing the VAS mean in both groups 12 h after surgery, group I had an average of 2.75, group C with higher average 3.35. However, this result was not statistically significant (P = 0.319). This study confirms the result published by Lepner15 not finding statistic significant differences between the control group with local anesthetic. Pavdilis, et al.17 claim in their article that the VAS scores in the study group were significantly lower than in the control group after three and six hours (P <0.01), whereas they did not differ significantly at 12 h and 24 h. In a study by Alam et al.[1] in 12 hours after surgery there was p <0.001, while the mean (± SD) was 4.72 (± 0.61) in the study group compared to 6.08 (± 0.64) in the control group. A systematic review published in 2005 shows that local anesthetic is effective when it infiltrated the incision site, but the effect is of short duration (1-6 h) in most studies, although some authors suggest the duration of action up to 24 hours[9].

Although not presented statistical significance (P = 0.632), there was reduction in opioid consumption in group I in relationship to group C; the first had 47.2% of patients using tramadol, and the second this number rose to 52.9%. Some studies showed a significant difference in the amount of narcotic analgesics asked for the patients between the control and anesthetic local group[1,10]. However, a meta-analysis published in 2006[19] showed that in only four of eight studies, wound infiltration with local anesthetic had better effect. Gupta[9] systematic review suggests that local anesthetic injected during LC does not result in reduced consumption of analgesics.

Exactly half of the patients requested opioid (tramadol) postoperatively. In the study of Grumberg et al.[8] figure as 60%; in Lepner, et al.[11] 30%. Each patient who requested dose of tramadol, made on average 1.14 times, similar to the average found by Alam, et al.[1], where the total requirement of narcotics in the study group was mean (SD) of 1.91 (± 0.61), while in the control group was 2.50 (± 0.51).

In the present study, each patient asked for almost a dose of tramadol; when prescribed in a fixed time every 6 h, each patient may use at least four doses. The total doses of tramadol used in all patients drop from 280 to about 75 doses. In addition, no statistical difference was found in pain among patients who used and who did not use tramadol. Lepner, Guroshina and Samarütel[11] states that the regular administration of NSAIDs combined with opioid at request in postoperative period, is usually effective in controlling pain after LC. Bisgaard[15] in his review of the analgesic treatment after LC argues that prophylactic use of opioids in the post-surgery is not recommended due to the many potential side effects. Short-acting opioids should be used only on demand, when other analgesic techniques fail.19 This fact allows to state that it is advantageous to prescribe tramadol if necessary, as well as reduce costs, avoid the side effects of opioids (delayed discharge, urine retention, nausea, vomiting, constipation).

This study's main limitation is the fact that the VAS has been applied in only one postoperative period. Therefore the results presented concerning the effect of local anesthetic on pain and tramadol consumption refer to 12 hours after surgery and will not extend to the more immediate postoperative period. The sample size can also be considered a limitation of this study, suggesting that further research with larger samples must be performed in an attempt to find statistical significance.

CONCLUSION

The infiltration of LC incisions with ropivacaine, although not significantly, provided decrease in postoperative pain and reduced opioid consumption after 12 hours postoperative follow-up. Pain after LC was well controlled with the use of NSAIDs, simple analgesics and opioids on demand without the need to use at fixed intervals.

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